Desalinated Water Delivery System:
Application for modification of the
Project Approval, Botany Bay Sector
relating to Dredged Material Storage in the Borrow Pit

for

Water Delivery Alliance
Sydney's Desalination Project

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GLOSSARY of TERMS

CD	Chart Datum
CSRP	Community and Stakeholder Relations Plan
DECCW	NSW Department of Environment, Climate Change and Water
DoP	NSW Department of Planning
DPI	NSW Department of Primary Industries
EA	Environmental Assessment
EP&A Act	*Environmental Planning and Assessment Act 1979*
NSWM	NSW Maritime
PPR	Preferred Project Report
WDA	Water Delivery Alliance

Executive Summary

The Water Delivery Alliance (WDA) has been established to design, construct and commission the pump station and desalinated water delivery system linking the desalination plant on the Kurnell Peninsula with the existing distribution network at Shaft 11C, Erskineville.

Sydney Water has received Concept Approval for the desalination project and Project Approval for the desalinated water delivery system. These Approvals were granted following consideration of a number of supporting documents, including the Major Project Application, Environmental Assessments (EA) and Preferred Project Reports (PPR). These documents envisaged the need to optimise the design based on additional engineering and environmental information that was to become available during detailed design. Since receipt of the Project Approval, WDA has undertaken a range of engineering and environmental investigations to inform the detailed design. WDA has also prepared a number of consistency assessments as well as four applications for modifications to the Project Approval; relating to refinements to the route and changes to the construction method across the project.

This application for modification has been prepared to seek approval of the proposed change to the permanent storage of dredged material in the existing borrow pit under Section 75W(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This document also assesses the environmental impacts of the proposed change in dredged material storage and concludes that overall, the proposed change will have no net change in environmental and social impacts, compared with the approved project.

1 Introduction

1.1 Background

The WDA has been established to design, construct and commission the pump station and desalinated water delivery system linking the desalination plant on the Kurnell Peninsula with the existing distribution network at Shaft 11C, Erskineville.

An EA was prepared by Sydney Water in November 2005 for the design, construction, operation and maintenance of the Sydney Desalination Project, consisting of the desalination plant, intakes and outlets, and water delivery system. In November 2006, Sydney Water received Concept Approval for the desalination project as a whole and Project Approval for all its components with the exception of the water delivery pipeline, as the system required further investigations and assessment.

An EA was prepared by Sydney Water in April 2007 for the design, construction and operation of the desalinated water delivery system from the desalination plant at Kurnell to Sydney's water distribution infrastructure system at Shaft 11C, Erskineville. The EA responded to the requirements of the Director-General of the Department of Planning (DoP).

Subsequent to the EA for the delivery system, a PPR was prepared to respond to issues raised in submissions made to the DoP during exhibition of the EA. The responses drew on the EA, new information gained since exhibition of the EA, and changes as a result of public inputs. The PPR also detailed refinements to the route and changes to the construction method made since completion of the EA and described the project for which approval was sought. The Minister for Planning granted Project Approval for the delivery system, subject to conditions, on 22 October 2007.

The Concept and Project Approvals were granted following consideration of the EA and PPR, and supporting documents. These documents envisaged the need to optimise the design based on additional engineering and environmental information that was to become available during detailed design.

Detailed design has been finalised and construction is near completion along most of the route.

Consistency assessments have been prepared for other sections of the project where refinements to the route or changes to the construction method have been proposed. Those consistency assessments concluded that the proposed refinements/changes were generally in accordance with the Concept and Project Approvals. In addition, four applications for modification have been submitted to the DoP for:

- proposed refinements to the route within the Urban Sydney Sector: Sydney North;
- changes to the construction method and an amendment to Condition 2.19 of the Project Approval for the Botany Bay Sector;
- amendment of Conditions 2.18 and 2.19 of the Project Approval relating to the installation of silt curtains the water quality monitoring requirements for the Botany Bay Sector works; and
- amendment to Condition 2.6 of the Project Approval relating to vibration.

On 13 June 2008 WDA received modification to the Project Approval for the Urban Sydney Sector refinements. Modification to the Project Approval for the Botany Bay Sector changes and amendment was received on 12 September 2008 and 28 December 2008. Modification to Condition 2.6 was received on 30 March 2009.

It should also be noted that on 2 September 2009 WDA prepared a consistency assessment for the use of EnergyAustralia's dredged material. The WDA were proposing to use the material from EnergyAustralia's dredging works in Botany Bay for backfilling the last section of the pipe trench and reinstating Lady Robinson's

Beach at Kyeemagh. After finalising works in the Bay rather than there being a deficit of material, there is now a surplus of clean sands that will need to be permanently stored in the existing borrow pit (the subject of this modification).

1.2 Purpose of this application for modification

Section 75W of the NSW EP&A Act relates to the modification of approved projects under Part 3A of the Act. Section 75W(2) allows a proponent to request that the Minister for Planning modify a project's approval. However, section 75W(2) also states that "*…approval for a modification is not required if the project as modified will be consistent with the existing approval."*

This application for modification has been prepared to:

- Outline the proposed change to the project.

Section 75W(4) allows the Minister to modify an approval (with or without conditions) or disapprove of the modification.

1.3 Approach to this application for modification

As discussed above, this application for modification has been prepared to seek approval of the proposed change to the permanent storage of dredged material in the existing borrow pit and assess the environmental impacts of the proposed change. This application for modification:

- Describes the proposed change to the construction methodology (refer Section 2)
- Assesses whether the change is permitted under the existing conditions of approval by considering:
    - whether the proposed change is generally in accordance with the documents listed in condition 1.1 of the Concept Approval "Terms of the Concept Approval" (refer Section 3)
    - whether the proposed change is generally in accordance with the documents listed in condition 1.1 of the Project Approval "Terms of the Project Approval" (refer Section 3)
- Assesses whether the change will make a material difference to anyone or the environment (refer Section 3)
- Assesses the potential environmental impacts of the change relative to those of the approved project (refer Section 4)
- Outlines issues relating to the change that were raised during consultation with affected stakeholders after receipt of the Project Approval, and during finalisation of the proposed change (refer Section 5)
- Identifies the next tasks following approval of the modification (refer Section 6).

Consideration is given to whether the proposed change is anticipated to result in any material changes to the impacts on the social or natural environment by considering the same key issues that were addressed in the EA and PPR.

2 Project descriptions and rationale for change

2.1 Description of the approved project – Water Distribution System

Chapter 10 of the PPR defined the project for which Sydney Water sought approval and states that:

"Sydney Water seeks Project Approval for construction, commissioning, operation and maintenance of a desalinated water delivery system linking the desalination plant on the Kurnell Peninsula with the existing distribution network.

Project Approval is sought for construction and operation of all components of the project, including those elements described in Chapter 5 of the Environmental Assessment of the Desalinated Water Delivery System, as amended by the refinements and changes outlined in Chapter 2 of this Preferred Project Report. In summary the indicative route is described in Table 10.1 and Figures 10-1, 10-2 and 10-3."

The delivery system will:

- *Be built to deliver an annual daily average of 500 ML of desalinated water per day;*
- *Link the desalination plant at Kurnell with Sydney's major water distribution system;*
- *Be generally located on the alignment indicated in Figure 10-1, Figure 10-2 and Figure 10-3;*
- *Be generally constructed using a combination of trenchless and trenched construction methods as indicated in Figure 10-1, Figure 10-2 and Figure 10-3;*
- *Require a range of construction related activities and facilities such as temporary laydown areas, temporary jetties, quays or work platforms, barges, site compounds, spoil stockpiles, connection to utility services and infrastructure, environmental controls etc;*
- *Include ancillary features to ensure safe operation and maintenance, including, but not limited to, air and scour valves, scour drain lines, isolation valves, pressure release valves, access chambers, cross connection pipework to the existing network, booster pump stations, surge protection equipment, and chlorine injection facilities;*
- *Require feasibility and pre-construction investigations, likely to include geotechnical, groundwater, soil, water and sediment studies along with other surveys and minor tasks or other activities likely to have minimal environmental impact; and*
- *Operate on a continuous (24 hours per day, 7 days per week) basis.*

The proposed change is considered to be generally consistent with this overall project description.

2.2 Description of the proposed change to the construction method – Botany Bay Sector

WDA propose to change one of the approved construction methods for the Botany Bay Sector of the desalinated water delivery system. Table 2.1 summarises the proposed change relative to the approved project. Further detail is provided in Sections 2.2.1 and 2.2.2. Figure 2.1 displays the proposed change addressed in this application for modification only.

Table 2.1: Summary of proposed change to the approved project.

Proposed change	Project as described in the PPR and Modification or as approved by Minister's Conditions of Approval	Proposed change related to this Application for Modification	Reference in this report
Storage of dredged material	Permanent storage of approximately 35,000 m^3 in the southern end of the existing borrow pit. (PPR) Temporary storage of dredged material in the southern end of the existing borrow pit. (Modification 15 July 2008)	Permanent storage of up to 150,000 m^3 in the southern end of the existing borrow pit.	2.3.1, 4.2, 4.3, 4.4, 4.5

2.2.1 Change – Storage of dredged material

The change relates to:

- permanent storage of clean sands within the southern portion of the existing borrow pit, Kyeemagh.

Existing Borrow pit, Kyeemagh

The PPR describes the storage of dredged material as:

"Approximately 200,000 m^3 of material removed from the initial sections of the trench off Silver Beach will need to be temporarily stored prior to its reuse for backfilling of the last section of trench off Kyeemagh."

"…it is proposed that temporary storage of dredged material occur along the north-south batter of the dredge basin."

The Modification (15 July 2008) assessed that only temporary storage of approximately 35,000m^3 clean sands would be required in the southern portion of the borrow pit. The Modification (15 July 2008) also identified an indicative area for dredged material storage. This area has since changed to a more suitable location (Figure 2.1) in terms of limiting potential impacts to the coastal processes along Lady Robinson's Beach.

The consistency assessment (2 September 2009) prepared for the use of EnergyAustralia's dredged material did not make allowance for any permanent storage of clean sands in the southern portion of the borrow pit. As outlined in the consistency assessment (2 September 2009) WDA had proposed to use all of the spoil deposited by EnergyAustralia in association with their Modified approval.

WDA now propose to permanently store up to 150,000 m^3 of clean sands within the existing borrow pit.

2.2.2 Rationale for Change

During the pipe laying operations the pipe trench was being backfilled to a height approximately 1 m above or below the existing seabed level. While the pipe trench ended up slightly mounded (i.e. up to 1m above in places) there was a deficit of material. However, following consultation with NSWM regarding the final profile of the backfilled pipe trench the maximum allowable height was reduced to level with the existing seabed. This change, along with the spoil deposited by EnergyAustralia (WDA has now taken control of this dredged material) under their approval has meant there is now a surplus of clean sands that will need to be permanently stored in the existing borrow pit. Up to 150,000 m^3 of clean sand is proposed to be permanently stored in the southern portion of the existing borrow pit (Figure 2.1). The clean sands would be placed below a level of approximately -6.5 m Chart Datum (CD) along the existing north-south batter on the western side of the existing borrow pit in a band approximately 200 m wide by 680m long.

The clean sands to be permanently stored in the borrow pit will be left in a form that minimises the potential for impacts to the coastal processes within Botany Bay, particularly impacts to Lady Robinsons Beach. In addition, the proposed change in storage volumes and footprint size will be managed and monitored in accordance with the requirements of Conditions 4.2 (regarding beach and foreshore) and 2.18, 2.19 and 5.2e (regarding water quality during dredging operations). Overall, the proposed change is anticipated to have no net change in the potential impacts to the environment, compared to the approved project.

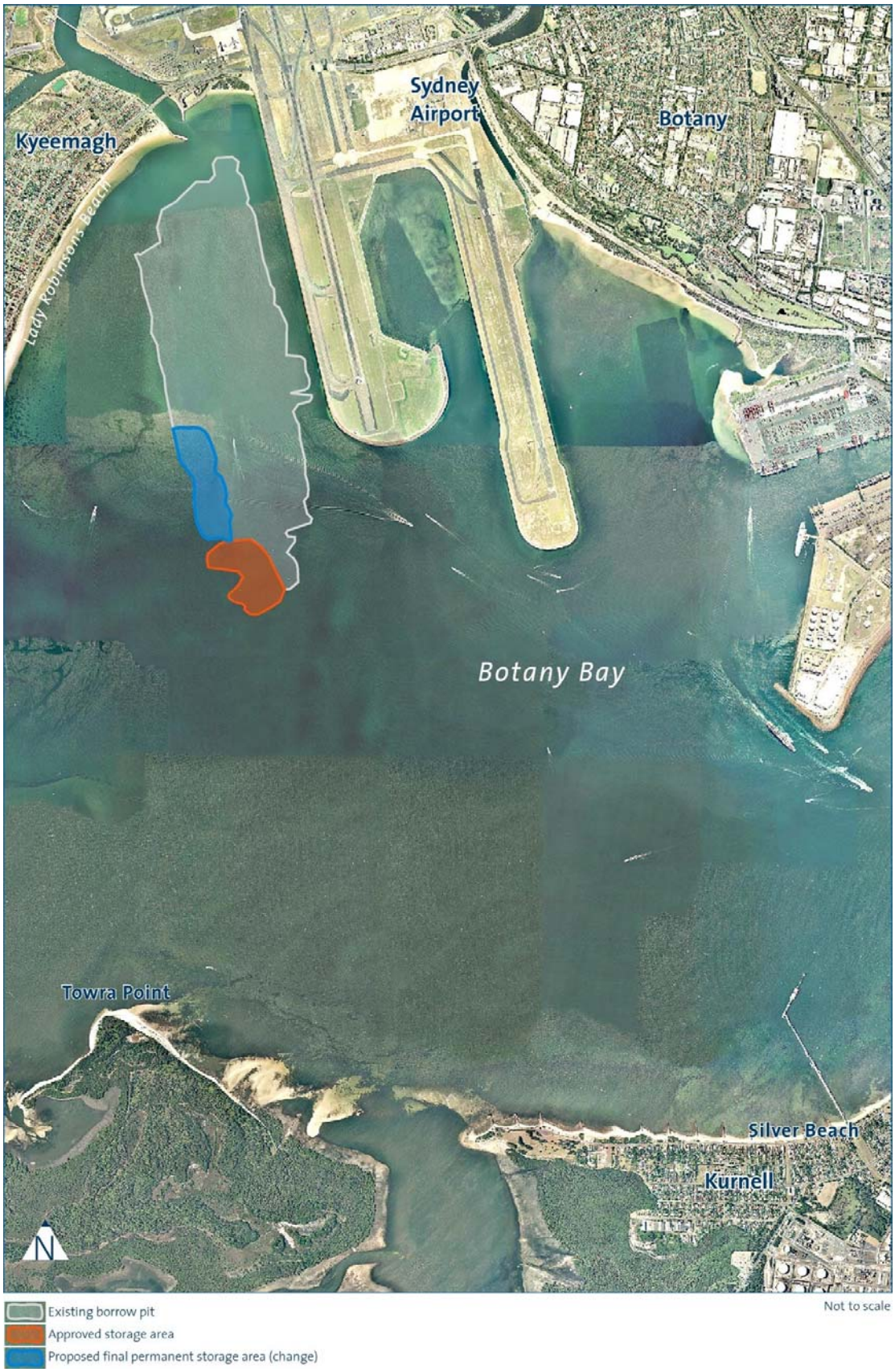

Figure 2.1: Project as modified and proposed change – relevant aspects only

3 Consistency Assessment

A consistency assessment was commenced to determine if the proposed change was generally in accordance with the planning approvals and associated documentation. It was found that the proposed change was not consistent with project as described in the PPR and subsequent Modification. At this point, preparation of the consistency assessment ceased, and this application for modification prepared. The results are summarised below.

3.1 Consistency with the Concept Approval

The proposed change does not relate to the Concept Approval. As such, the proposed change is considered to be consistent with the Concept Approval. Refer to Appendix A for further details.

3.2 Consistency with the Project Approval

The Project Approval includes a number of conditions with which the project must comply. These conditions relate to requirements such as environmental monitoring, auditing, etc, or to other parts of the project, for example impacts associated with the land pipeline. Appendix A includes details of consistency of the proposed change with the Project Approval. A copy of the Project Approval as modified is included as Appendix B.

Condition 1.1 - Terms of the Project Approval requires the project to be carried out in accordance with various documents including the conditions of Project Approval.

Condition 4.2 is also relevant to this application for modification in that it will be used as the primary mechanism guiding environmental management. WDA do not propose to amend Condition 4.2.

3.3 Are any new conditions required?

Section 4 assesses the potential environmental impacts associated with the proposed change and identifies the Minister's Conditions of Approval that will be implemented to manage impacts. As the impacts can be managed by implementing the existing Minister's Conditions of Approval (and Statements of Commitment), it is considered that new conditions are not required.

3.4 Assessing consistency with the approved project

When assessing consistency, it is generally accepted that the key tests must be drawn from the objectives of the project, description of the approved activity, and the described impacts of the project. The project objectives, description, and assessment of potential impacts are contained in a number of documents including:

- Major Project Application
- EA of the Concept Plan and PPR for Sydney's Desalination Project
- EA and PPR for the Desalinated Water Delivery System

3.4.1 Objectives

The proposed change is generally consistent with the objectives of the project (refer to Appendix A).

3.4.2 Project Description

The proposed change is generally consistent with the project description; however the volume of clean sand and the overall storage footprint has increased compared to the description in the EA, PPR and subsequent Modification (12/9/08). Therefore, the proposed storage would impact on coastal processes and whether the footprint would remain along the batter (away from the juvenile snapper habitat).

3.4.3 Impacts

Section 4 assesses the potential impacts of the proposed change. When comparing whether the proposed and approved impacts are consistent, the following issues need to be addressed:

- Are there any significant impacts?
- Are the proposed impacts similar in scale to the approved impacts?
- Will someone be affected by an impact who was not previously impacted?
- Are there any new impacts and who/what will be affected?

These issues are discussed below.

Are there any significant impacts?

The proposed change in the volume of dredged material and the increased size of the long term storage footprint will not result in any significant environmental impacts. The proposed change will not affect the environmental and social impacts, compared to the approved project. Existing potential impacts will be managed by implementing the Minister's Conditions of Approval and Statements of Commitment (refer to Section 4).

Are the proposed impacts similar in scale to the approved impacts?

The proposed change will not affect the environmental or social impacts, compared to the approved project, and therefore the impacts are similar in scale to the approved impacts.

As described in Section 4, the proposed change will have no net effect on the overall environmental impacts. Potential impacts will be managed by implementing the Minister's Conditions of Approval and relevant Statements of Commitment (refer to Section 4).

Will someone be affected by an impact who was not previously impacted?

The proposed change will not affect anyone that was not previously impacted. WDA has consulted with affected stakeholders including NSW Maritime (NSWM) and NSW Department of Primary (DPI) to identify potential issues (refer to Section 5). Potential issues discussed primarily related to whether the proposed storage would impact on coastal processes and whether the footprint would remain along the batter (away from the juvenile snapper habitat).

Are there any new impacts and who/what will be affected?

The proposed change will not result in new impacts.

Based on the above considerations of consistency with objectives and impacts, the proposed change is considered to be generally consistent with the approved project. However, the proposed change is considered to be inconsistent with the project description and hence this application for modification has been prepared.

4 Environmental assessment

4.1 Gap Analysis / Summary of Change in Impact

This section compares the potential impacts from the proposed change against the approved project. The comparison uses the key potential environmental impacts assessed in the EA and PPR. Table 4.1 summarises the relative change in environmental impacts associated with the proposed change. Additional detail is provided in Sections 4.2 and 4.3.

The assessment has been limited to the most relevant key issue, namely coastal processes.

Table 4.1: Change in environmental impact due to the proposed change

Aspect	Relative change in environmental impact	Additional management measures required
Coastal Processes	No change in impacts associated with proposed change to storage of dredged material in the borrow pit.	Dredged material will be re-worked to reduce the profile of the stockpile. This will reduce the potential for impacts to coastal processes within Botany Bay.

4.2 Summary of Approved Project

The EA, PPR and *Application for Modification of the Botany Bay Sector* envisaged the need for both temporary and permanent material storage associated with the Bay works, due to an estimated surplus of material. Since receipt of the modified Project Approval, additional engineering and environmental investigations and the progression of works within the Bay have informed the detailed design. The latest information has highlighted an increase in the dredged material to be stored in the southern portion of the borrow pit.

WDA now propose to permanently store up to 150,000m^3 of surplus dredged material in the southern end of the borrow pit. This material has been placed in the existing borrow pit during construction of the desalinated water pipeline across Botany Bay. The borrow pit is the same material storage location identified in the *Application for Modification of Project Approval for the Botany Bay Sector*. The Modification (15 July 2008) identified an indicative area for dredged material storage. This area has since changed to a more suitable location (Figure 2.1) in terms of limiting potential impacts to the coastal processes along Lady Robinson's Beach.

4.3 Assessment of Modified Project

4.3.1 Coastal Processes

The proposed change has the potential to impact on coastal processes.

4.3.2 Summary of Approved Project

The approved project included activities with the potential to impact on coastal processes, including:

- temporary storage of approximately 200,000 m^3 of material in the existing borrow pit
- permanent storage of approximately 35,000 m^3 of residual dredged material along the north-south batter of the existing borrow pit

Numerical modelling conducted by Cardno Lawson Treloar (CLT 2007) for the EA and PPR, showed that both the temporary storage of the full volume of material (200,000 m^3) and the permanent storage of residual material (approximately 35,000 m^3) would have minor or negligible impacts to the shoreline processes in terms of wave height and direction, sediment transport rates and shoreline evolution. The location of the storage areas within the dredge basin was also investigated and it was concluded that the north-south batter was the most suitable location for both the temporary and permanent storage.

4.3.3 Assessment of Modified Project

The proposed change to the storage of dredged material has the potential to result in impacts to coastal processes of Botany Bay.

The volume of dredged material to be stored permanently has increased from 35,000 m^3 to up to 150,000 m^3. Bathymetric surveys of the spoil and borrow pit area have shown that the total quantity of material remaining is larger and in the order of ~150,000m^3. Furthermore the placed spoil is irregular in crest level. Potential impacts to coastal processes relating to the storage of dredged material have been modelled by CLT (Appendix C).

Following discussions with CLT, and in order to minimise the impact on coastal processes of the longterm storage of the actual placed material, it is proposed for the material to be reworked into a thinner layer (below -6.5mCD) by expanding the existing storage eastward, thereby extending the footprint from 100m x 680m to 200m x 680m.

Based on the numerical modelling undertaken by CLT included as Appendix C, the change to the proposed storage of dredged material, with the profile recommended (ie 200m x 680m, below -6.5mCD), is not expected to have significant impacts on coastal processes. The report found that the proposed permanent storage of dredged material in the borrow pit will result in shoreline changes that are within the range of natural beach width variability and consistent with the impacts described in the previous report for the storage of 35,000 m^3 in the same general location.

4.4 Management Measures / Conclusion

The proposed change will result in an equivalent impact on coastal processes, compared to the approved project in terms of effects on shoreline processes, wave height, energy and direction, sediment transport and shoreline evolution.

To minimise impacts to coastal processes the dredged spoil will be reworked as a smooth storage below -6.5mCD along the north-south batter as proposed. The north and south batters of this low mound will be profiled as flat as possible (flatter than 1V:10H) to minimise end-effects.

Potential impacts on coastal processes will be monitored in accordance with the Beach and Foreshore Monitoring Program developed by WDA in consultation with NSW Department of Environment, Climate Change and Water (DECCW) and DPI. Potential impacts will also be managed by undertaking the changed construction methods in accordance with Conditions 2.18, 2.19, 2.20, 2.21, 2.22, 2.24, 4.1, 4.2 and Condition 5.2e of the Project Approval. No additional Statements of Commitments are considered necessary for the proposed change.

5 Consultation

WDA has consulted with potentially affected stakeholders in regards to the proposed change. This consultation has been undertaken in accordance with the project-wide Community and Stakeholder Relations Plan (CSRP) which outlines WDA's approach to community and stakeholder relations. The consultation specifically targeted relevant government agencies including DPI and NSWM.

Detail on the consultation undertaken and any issues raised are provided below.

Additionally, based on the principles outlined in the CSRP, broader public consultation among local communities and recreational Bay users was not undertaken as the proposed change relates mainly to regulator interests.

Consultation with relevant government agencies

WDA met with DPI on 3 November 2009, followed by a phone call on 11 November 2009. During the meeting and the phone call the change in the storage volume and size was discussed. DPI was comfortable with the proposed change and the application for modification. DPI did not raise any extra issues other than potential impacts to coastal processes (addressed in Section 4.3.1).

WDA also met with NSWM on the 29 November 2009 to discuss the proposed change to store clean sands within the existing borrow pit. NSWM raised several matters in relation to the proposed change, they were:

- potential impacts to coastal processes (addressed in Section 4.3.1);
- that WDA consult with DPI (addressed above); and
- the need for compensation for permanent storage of dredged material on their land (to be addressed outside this document).

6 Implementation

6.1 Environmental Safeguards

The environmental assessment (Section 4) undertaken for the proposed change indicates there would be no change in environmental and social impacts for the project overall.

The existing Statements of Commitment and Minister's Conditions of Approval are considered sufficient to manage potential impacts associated with the proposed change. No additional or new Statements of Commitment or Conditions of Approval are considered necessary.

Relevant Statements of Commitment from the PPR which have been identified in this document have been included as Appendix D.

6.2 Tasks following approval of modification

Once the Minister for Planning approves the modification, WDA will review the terms of approval to determine whether any actions are required to ensure compliance with any additional requirements. If required, WDA would then undertake such actions including review and update of relevant:

- Information provided to stakeholders such as NSWM and other users of the Bay concerning the proposed change
- Management plans or procedures required by the Approvals or Statements of Commitment, including those approved by the Director-General of the DoP. This process will be undertaken in accordance with the WDA procedure for Altering an Activity Approved by the Minister.

7 Conclusion

This application for modification seeks approval of the proposed change to permanently store up to 150,000m^3 of dredged material in the existing borrow pit. Section 75W of the EP&A Act provides for the Minister for Planning to modify a project approval, with or without conditions. WDA has assessed the environmental impacts associated with the proposed change. Overall, there would no net change in environmental and social impacts for the project due to the proposed change, compared to the approved project. There is no need for additional or new commitments or Minsters Conditions of Approval.

Reference

Carno Lawson Treloar (2007) *Coastal Processes for the Pipeline Crossing of Botany Bay*